

Workshop: Innovative Designs for the Next Large Aperture UV/Optical Telescope (NHST)

Dates: April 10-11, 2003

Location: STScI, Baltimore, Maryland

Lead Author: B. Martin Levine

Title: The Nulling Coronagraph-Using a Nulling Interferometer for Planet Detection in Visible Light with a Single Aperture Telescope

Authors: Michael Shao, B. Martin Levine, J. Kent Wallace, and Duncan Liu

Abstract: This talk describes a space mission for direct detection of Earth-like extrasolar planets using a 'nulling coronagraph' instrument behind a 4m telescope in space. A 4 beam nulling interferometer is synthesized from the telescope pupil, to produce a null proportional to θ^4 , which is then filtered by a coherent array of single mode fibers to suppress the residual scattered light. Starlight suppression of $1e-10$ is achievable using diffraction limited telescope optics and similar quality components in the optical train ($\lambda/20$). We show key features of the system design, present latest results of laboratory work in demonstrating deep and stable nulls, and discuss future key technical milestones.